WHAT IS CLAIMED IS:

1. A method of time scale modification of a digital audio signal comprising the steps of:

calculating a discrete Fourier transform of first equally spaced, overlapping time windows having a first overlap amount;

partitioning the spectrum into a plurality of contiguous spectral bands according to a Bark scale where each spectral band has an extent dependent upon human frequency perception;

identifying a dominant spectral line having the greatest magnitude within each spectral band;

calculating a phase difference for the dominant spectral line of each spectral band by a phase vocoder algorithm;

calculating a phase difference for each of a predetermined number of spectral lines near the dominant spectral line within each spectral band as the phase difference of the corresponding dominant spectral line;

calculating a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm; and

calculating an inverse discrete Fourier transform resulting in equally spaced, overlapping time windows having a second overlap amount employing the calculated phase difference for each spectral line, the second overlap selected having a ratio to the first overlap amount to achieve a desired time scale modification.

2. The method of claim 1, wherein:

the predetermined number of spectral lines near the dominant spectral line is 4 for a 1024-point spectrum.

3. The method of claim 1, further comprising the step of:

merging nearby spectral lines that are within a predetermined frequency range of each other prior to calculating the phase difference.

4. The method of claim 1, wherein:

said step of partitioning the spectrum into a plurality of contiguous spectral bands according to a Bark scale employs predetermined spectral bands unrelated to the digital audio signal.

5. The method of claim 1, wherein:

said step of partitioning the spectrum into a plurality of contiguous spectral bands according to a Bark scale includes adjusting boundaries of spectral bands to maintain important frequency groups within the same spectral band.

6. A digital audio apparatus comprising:

a source of a digital audio signal;

a digital signal processor connected to said source of a digital audio signal programmed to perform time scale modification on the digital audio signal by

calculate a discrete Fourier transform of first equally spaced, overlapping time windows having a first overlap amount,

partition the spectrum into a plurality of contiguous spectral bands according to a Bark scale where each spectral band has an extent dependent upon human frequency perception,

identify a dominant spectral line having the greatest magnitude within each spectral band,

calculate a phase difference for the dominant spectral line of each spectral band by a phase vocoder algorithm,

calculate a phase difference for each of a predetermined number of spectral lines near the dominant spectral line within each spectral band as the phase difference of the corresponding dominant spectral line;

calculate a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm, and

calculate an inverse discrete Fourier transform using equally spaced, overlapping time windows having a second overlap amount employing the calculated phase difference for each spectral line thereby forming a time scale modified digital audio signal, the second overlap selected having a ratio to the first overlap amount to achieve a desired time scale modification; and

an output device connected to the digital signal processor for outputting the time scale modified digital audio signal.

7. The digital audio apparatus of claim 6, wherein:

the predetermined number of spectral lines near the dominant spectral line is 4 for a 1024-point spectrum.

8. The digital audio apparatus of claim 6, wherein:

said digital signal processor is further programmed to merge nearby spectral lines that are within a predetermined

frequency range of each other prior to calculating the phase difference.

9. The digital audio apparatus of claim 7, wherein:

said digital signal processor is programmed to partition the spectrum into a plurality of predetermined spectral bands according to the Bark scale unrelated to the digital audio signal.

10. The digital audio apparatus of claim 1, wherein:

said digital signal processor is programmed to partition the spectrum into a plurality of contiguous spectral bands by adjusting boundaries of spectral bands to maintain important frequency groups within the same spectral band.